Space Weather Forecast

Issued on Wednesday 30 October 2024 at 13:07 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Occasional Moderate flares expected, with slight chance of Strong flares. S1 Minor Solar Radiation Storm easing.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate-class flare observed, however this occurred alongside a very long duration Common-class flare due to an eruption off the southwest disc. This was from a filament, also called a prominence when on the edge of solar disc, which is a line a material held together by the suns magnetic field, but can also be the source of eruptions. There are now eleven sunspot containing active regions, with one region fading from view on the west limb and another redeveloping in the northwest disk. The south-centre disc contains a cluster of three notable spots. The region just to the northwest of this group also remains of interest. A sunspot in the northeast disk remains the most likely flare source, with a complex magnetic structure.

No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Ongoing fast winds were observed. Solar wind speeds were slightly elevated to elevated, highly variable between 450-550 km/s. The Interplanetary Magnetic Field (IMF), Bt, was weak, with the important north-south component, Bz, varying weakly but favoring a negative (southward) orientation. Resulting geomagnetic activity was Quiet to Active (Kp2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at at S2 Moderate Radiation Storm to begin the period. This eased to S1 Minor Radiation Storm levels from 29/1455 UTC, and continued easing.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Moderate activity is expected to continue through the period, with occasional Moderate flares expected and a persistent slight chance of an isolated Strong flare.

Solar Wind / Geomagnetic Activity: There are no CME arrivals currently expected, although forecast is lower than usual confidence. Current fast winds expected to slowly ease towards background through days 1-2 (30-31 Oct). Mainly Quiet geomagnetic activity is expected, with occasional Unsettled intervals and a chance of Active intervals on day 1 (30 Oct). Activity is currently expected to remain generally Quiet to Unsettled thereafter.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is expected to continue easing, likely falling below the S1 Minor Radiation Storm level in the next 48 hours. However, any further notable flares will bring the potential for further enhancement.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	70	70	70	70
Very Active	R3-R5 (X Class)	No	20	20	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	99	80	40	20
Very Active	≥ S3 *	No	5	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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